Pathology LAB 5
Immune

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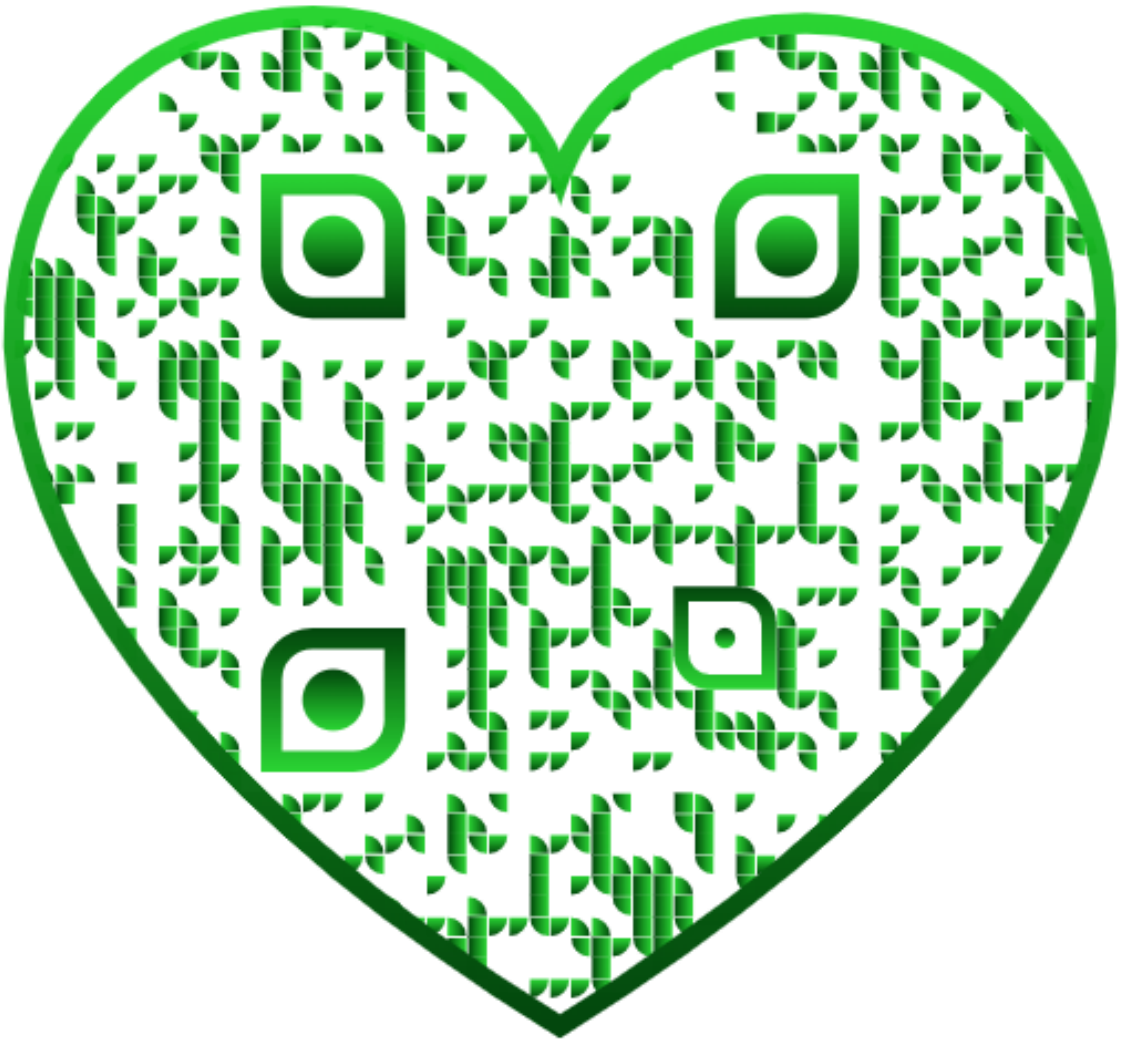
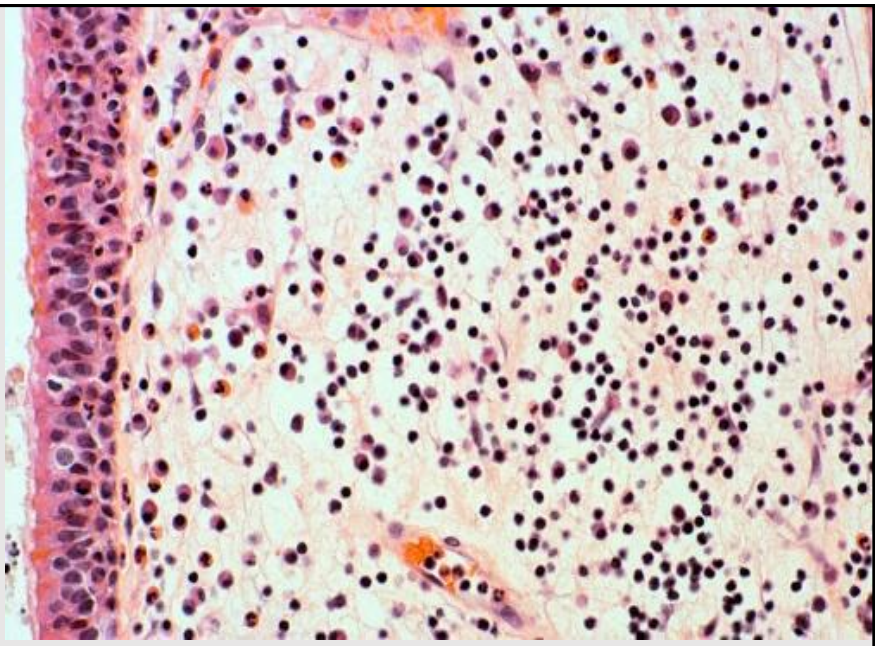
Table 5.2 Mechanisms of Hypersensitivity Reactions

Type	Immune Mechanisms	Histopathologic Lesions	Prototypical Disorders
Immediate (type I) hypersensitivity	Production of IgE antibody → immediate release of vasoactive amines and other mediators from mast cells; later recruitment of inflammatory cells	Vascular dilation, edema, smooth muscle contraction, mucus production, tissue injury, inflammation	Anaphylaxis; allergies; bronchial asthma (atopic forms)
Antibody-mediated (type II) hypersensitivity	Production of IgG, IgM → binds to antigen on target cell or tissue → phagocytosis or lysis of target cell by activated complement or Fc receptors; recruitment of leukocytes	Phagocytosis and lysis of cells; inflammation; in some diseases, functional derangements without cell or tissue injury	Autoimmune hemolytic anemia; Goodpasture syndrome
Immune complex–mediated (type III) hypersensitivity	Deposition of antigen-antibody complexes → complement activation → recruitment of leukocytes by complement products and Fc receptors → release of enzymes and other toxic molecules	Inflammation, necrotizing vasculitis (fibrinoid necrosis)	Systemic lupus erythematosus; some forms of glomerulonephritis; serum sickness; Arthus reaction
Cell-mediated (type IV) hypersensitivity	Activated T lymphocytes → (1) release of cytokines, inflammation and macrophage activation; (2) T cell–mediated cytotoxicity	Perivascular cellular infiltrates; edema; granuloma formation; cell destruction	Contact dermatitis; multiple sclerosis; type 1 diabetes; tuberculosis



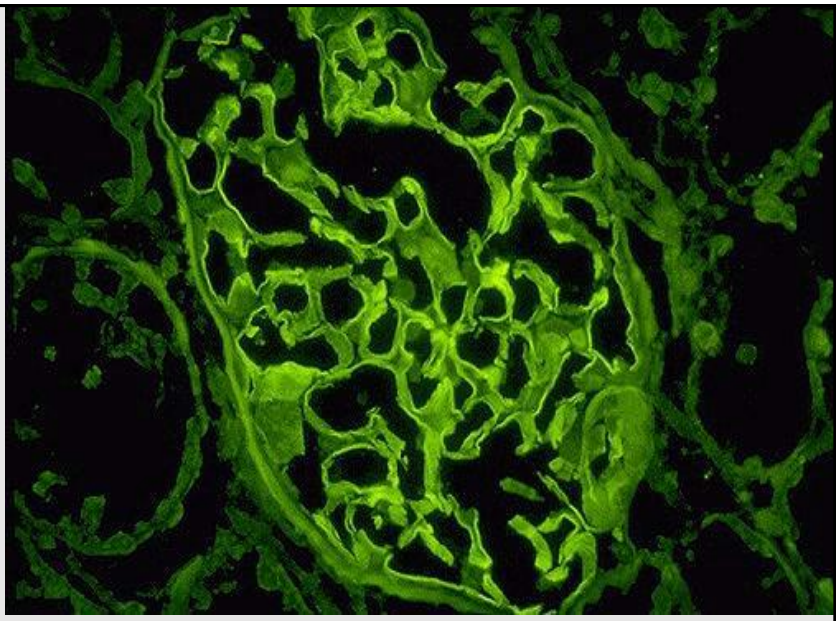


Anaphylaxis
(Type I hypersensitivity)

Features:
1. Congestion & Edema
2. Plasma cells & Eosinophils & Lymphocytes.

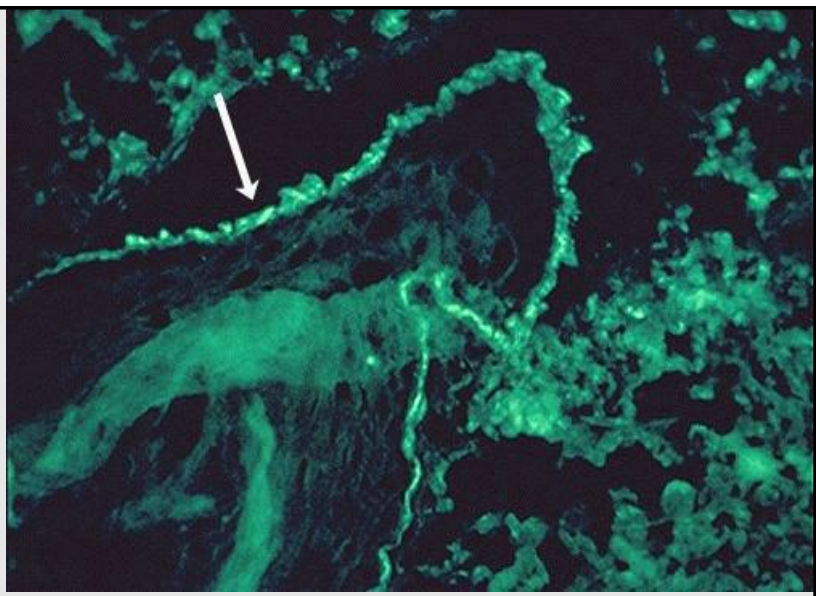
Laryngeal Edema
(Type I Hypersensitivity)

Features:
Narrowing of Larynx with edema.



Goodpasture Syndrome
(Immunofluorescence)
Type II Hypersensitivity
IgG

Features:
Linear pattern (anti-glomerular basement membrane antibody)

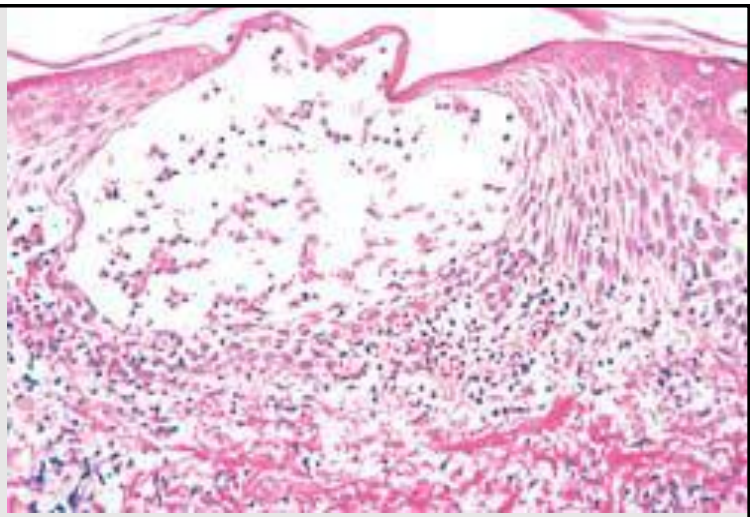


Type III Hypersensitivity
(Immunofluorescence)

Features:
Granular Pattern of Antibodies Deposition.

Contact dermatitis (gross)
(Type IV Hypersensitivity)

Features:
Erythema and swelling at site of contact.



Contact dermatitis (microscopic)
(Type IV Hypersensitivity)

Features:

1. Thickening of dermis due to fibrosis.
2. Thinning of Epidermis.
3. Intra-epidermal Lymphocytic infiltration.

SLE (gross)

Type III Hypersensitivity

Features:

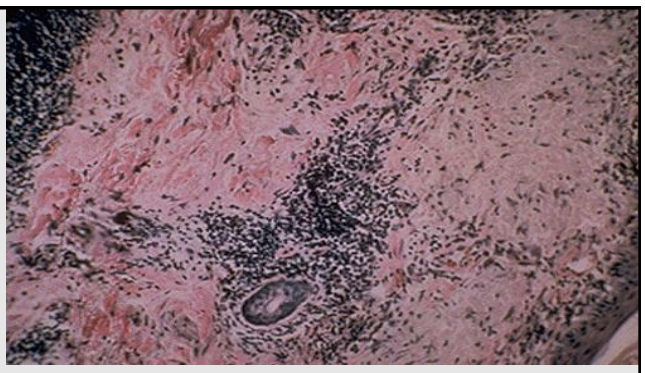
Butterfly rash appearance.

SLE (Microscopic)

Type III Hypersensitivity
(Skin Biopsy)

Features:

1. Vasculitis.
2. Chronic Inflammatory cell infiltrate.

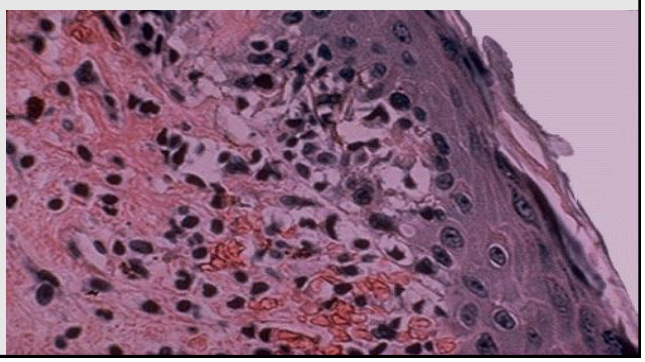


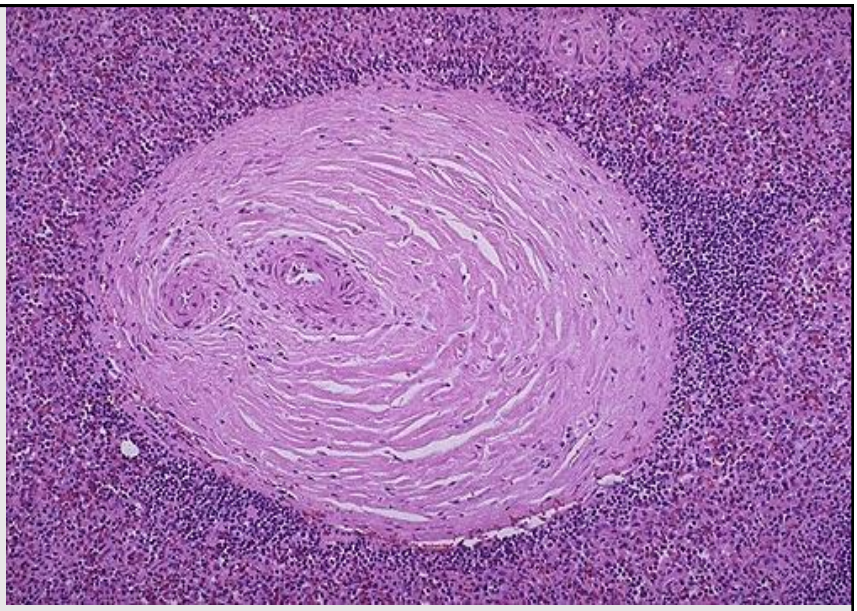
SLE (Microscopic)

Type III Hypersensitivity
(Skin Biopsy)

Features:

1. Severe inflammatory skin infiltrate in the upper dermis.
2. The basal layer of epidermis is undergoing vacuolization and dissolution.
3. There is RBCs extravasated into the upper dermis (which are the reasons for the rash).

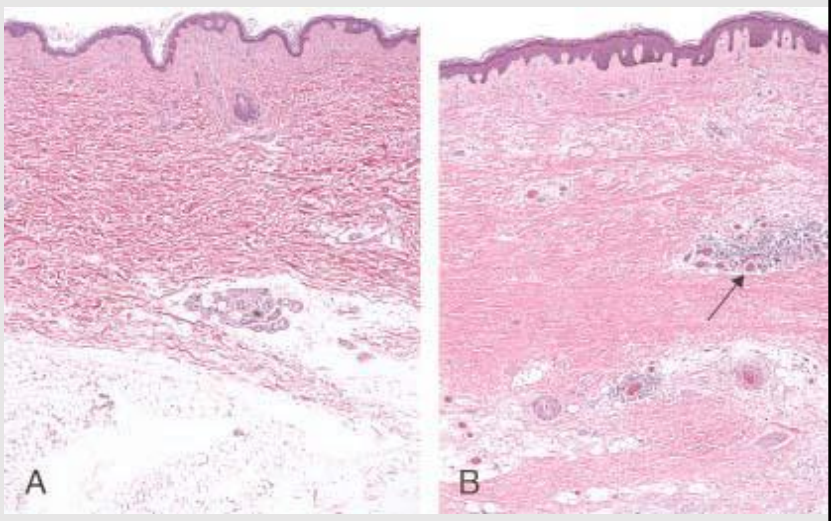




SLE (Microscopic)
Type III Hypersensitivity
(Spleen Biopsy)
Features:
1. Onion Skinning (Peri-arteriolar Fibrosis).

Scleroderma (gross)
Type IV Hypersensitivity

Features:
1. Cheilosis at the corners of the mouth.

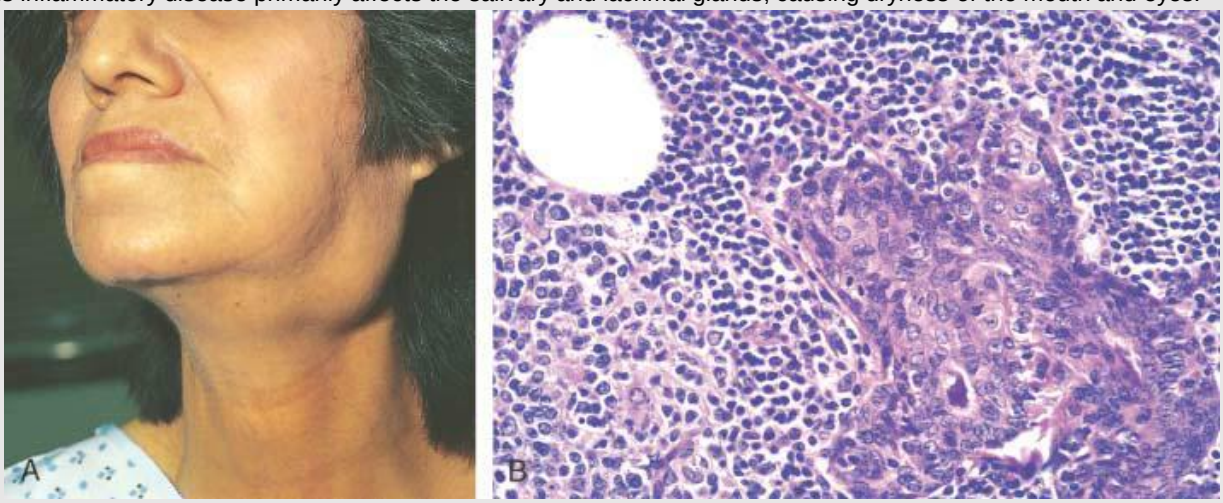


Scleroderma (Microscopic)
Type IV Hypersensitivity
Features:

A. Normal Picture.
B. Abnormal Picture: complete loss of skin appendages + thin Epidermis + Thick Dermis + Fibrosis

Sjögren syndrome (Type IV Hypersensitivity)

It is inflammatory disease primarily affects the salivary and lacrimal glands, causing dryness of the mouth and eyes.

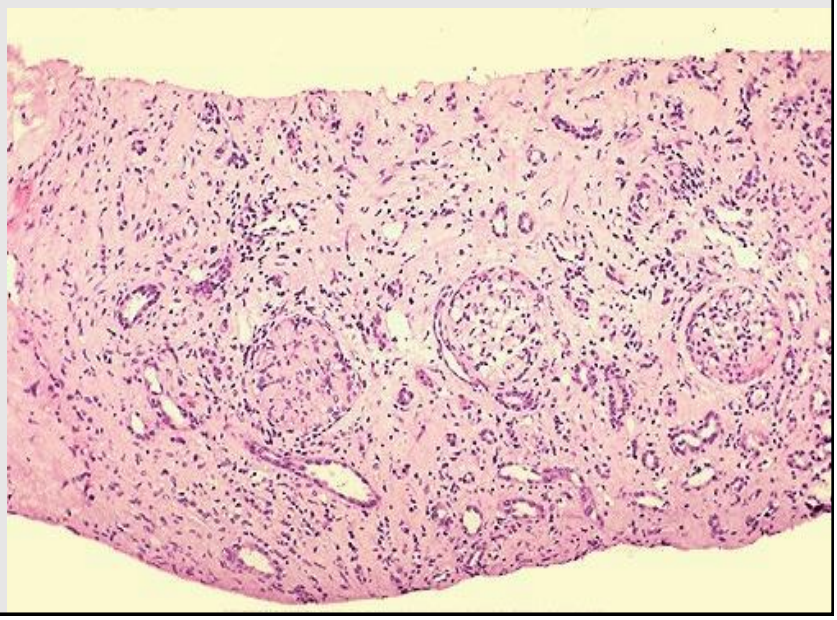


Gross: Enlargement of the Salivary Gland.

Microscopic: Chronic inflammatory infiltrate and ductal epithelial hyperplasia.

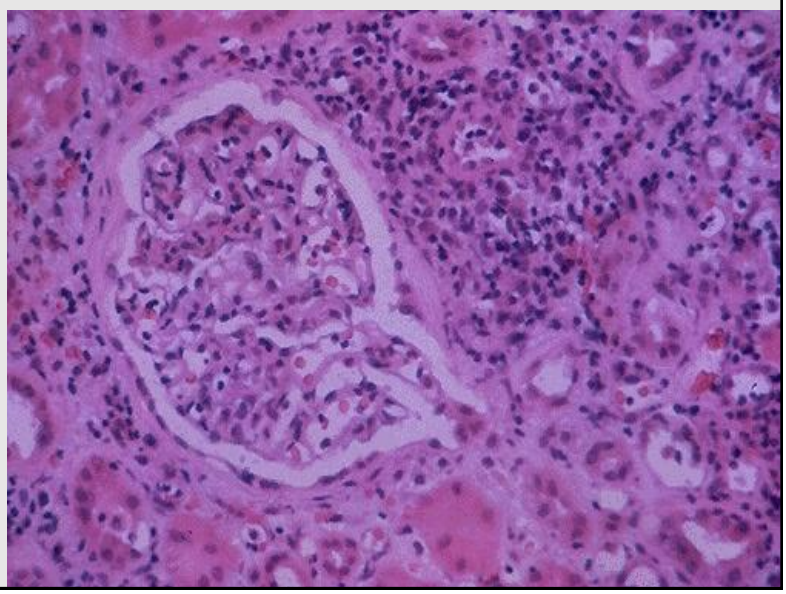
Chronic Renal Transplant Rejection (Microscopic)

Features:
1. Severe Interstitial Fibrosis.
2. Lymphocytic infiltration.



Acute Renal Transplant Rejection (Microscopic)

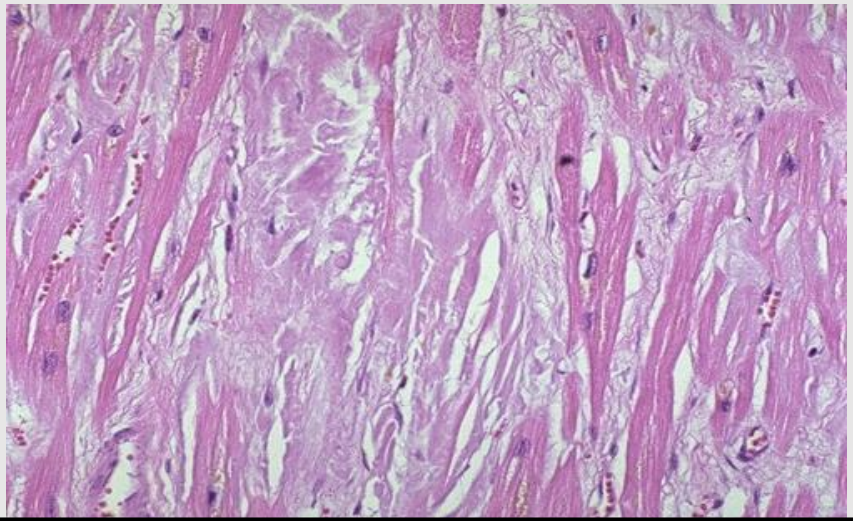
Features:
1. Interstitial inflammation.
2. The glomerulus is normal
3. Lymphocytic infiltration of tubules (upper right).



Amyloidosis in the Heart
(Microscopic)

Features:

1. Pale pink amyloid deposits between the darker red myofibers.



Thank you..

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